

CLAIMS

What is claimed is:

Claim 1. A solder feeding device comprising:

a reservoir being configured to melt a solid solder wire into molten solder, said reservoir being fluidly connectable to an injection molded solder system;

a drive unit being configured to selectively feed said solid solder wire into said reservoir;

a first lead in electrical communication with said drive unit; and

a second lead in electrical communication with said drive unit, said first lead being positioned in said reservoir so that said first lead electrically communicates with said second lead through said molten solder when said molten solder reaches a triggering level and so that said first lead does not electrically communicate with said second lead when said level is below said triggering level, said drive unit being configured to feed said solid solder wire into said reservoir based upon a state of electrical communication between said first and second leads.

Claim 2. The device of claim 1, wherein said drive unit feeds said solid solder wire into said reservoir when said first and second leads are in electrical communication with one another or when said first and second leads are not in electrical communication with one another.

Claim 3. The device of claim 1, wherein said second lead is positioned in said reservoir at or below said triggering level.

Claim 4. The device of claim 1, wherein said second lead is in electrical communication with said solid solder wire so that said first lead electrically communicates with said second lead through said molten solder and said solid solder wire when said molten solder is at said triggering level.

Claim 5. The device of claim 4, wherein said second lead is positioned inside or outside of said reservoir.

Claim 6. The device of claim 1, wherein said reservoir is configured to maintain a positive pressure therein while said drive unit feeds said solid solder wire into said reservoir.

Claim 7. The device of claim 6, further comprising a sliding seal around said solid solder wire, said sliding seal being configured to maintain said positive pressure in said reservoir while said drive unit feeds said solid solder wire into said reservoir.

Claim 8. The device of claim 1, further comprising positioning a feed guide for guiding said solid solder wire from said drive unit into said reservoir.

Claim 9. The device of claim 8, further comprising a sliding seal around the solid solder wire in said feed guide to maintain a positive pressure in said reservoir while said drive unit feeds said solid solder wire to said reservoir.

Claim 10. A solder feeding device comprising:

a reservoir being configured to melt a solid solder wire into molten solder, said reservoir being fluidly connectable to an injection molded solder system;

a drive unit being configured to selectively feed said solid solder wire into said reservoir;

a control circuit having an open state and a closed state, said control circuit controlling said drive unit to feed said solid solder wire into said reservoir based on said open state or said closed state;

a pair of leads in electrical communication with said control circuit, said control circuit being in said closed state when said pair of leads are in electrical communication with one another and said open state when said pair of leads are not in electrical communication with one another, said pair of leads electrically communicating with one another through said molten solder when said molten solder fills said reservoir to a triggering level.

Claim 11. The device of claim 10, wherein said control circuit causes said drive unit to feed said solid solder wire into said reservoir unless said molten solder is at said triggering level.

Claim 12. The device of claim 10, wherein said control circuit only causes said drive unit to feed said solid solder wire into said reservoir when said molten solder is not at said triggering level.

Claim 13. The device of claim 10, wherein said pair of leads has a first lead and a second lead, said first lead being positioned in said reservoir at said triggering level

Claim 14. The device of claim 13, wherein said second lead is positioned in said reservoir at or below said triggering level.

Claim 15. The device of claim 13, wherein said second lead is in electrical communication with said solid solder wire so that said first lead electrically communicates with said second lead through said molten solder and said solid solder wire when said molten solder is at said triggering level.

Claim 16. The device of claim 15, wherein said second lead is positioned inside or outside of said reservoir.

Claim 17. The device of claim 10, wherein said reservoir is configured to maintain a positive pressure therein while said drive unit feeds said solid solder wire into said reservoir.

Claim 18. The device of claim 17, further comprising a sliding seal around said solid solder wire, said sliding seal being configured to maintain said positive pressure in said reservoir while said drive unit feeds said solid solder wire into said reservoir.

Claim 19. The device of claim 10, further comprising positioning a feed guide for guiding said solid solder wire from said drive unit into said reservoir.

Claim 20. The device of claim 19, further comprising a sliding seal around the solid solder wire in said feed guide to maintain a positive pressure in said reservoir while said drive unit feeds said solid solder wire to said reservoir.

Claim 21. A method of feeding solid solder wire to a reservoir of molten solder, comprising:

positioning a first lead in the reservoir so that said first lead electrically communicates with a second lead through the molten solder when a level of the molten solder is at least equal to a triggering level and so that said first lead does not electrically communicate with said second lead when said level is below said triggering level;

activating a drive unit to feed the solid solder wire to the reservoir when the molten solder in the reservoir is below said triggering level; and

deactivating said drive unit when the molten solder in the reservoir is at and above said triggering level.

Claim 22. The method of claim 21, wherein electrical communication between said first and second leads at said triggering level closes a control circuit.

Claim 23. The method of claim 22, wherein said control circuit activates or deactivates said drive unit when said control circuit is closed.

Claim 24. The method of claim 21, further comprising positioning said second lead in the reservoir at or below said triggering level.

Claim 25. The method of claim 21, further comprising positioning said second lead in electrical communication with the solid solder wire so that said first lead electrically communicates with said second lead through the molten solder and the solid solder wire when said level is at said triggering level.

Claim 26. The method of claim 25, wherein said second lead is positioned inside or outside of the reservoir.

Claim 27. The method of claim 21, further comprising maintaining a desired pressure in the reservoir while said drive unit feeds the solid solder wire to the reservoir.

Claim 28. The method of claim 27, wherein said desired pressure is a positive pressure maintained by a sliding seal around the solid solder wire.

Claim 29. The method of claim 28, further comprising a pressure assist system for generating said positive pressure in the reservoir.

Claim 30. The method of claim 27, further comprising a vacuum assist system for drawing said molten solder from the reservoir.

Claim 31. The method of claim 21, further comprising positioning a feed guide in a cap of the reservoir, said feed guide guiding the solid solder wire from said drive unit into said reservoir.

Claim 32. The method of claim 31, further comprising positioning a sliding seal around the solid solder wire in said feed guide to maintain a positive pressure in the reservoir while said drive unit feeds the solid solder wire to the reservoir.